

SOCIAL COMPARISON TEST USING WOMEN'S SUBJECTIVE AND
PHYSIOLOGICAL REACTIVITY TO THIN AND AVERAGE SIZE MODELS

A Thesis

by

JEANNINE PAOLA TAMEZ

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

May 2008

Major Subject: Psychology

SOCIAL COMPARISON TEST USING WOMEN'S SUBJECTIVE AND
PHYSIOLOGICAL REACTIVITY TO THIN AND AVERAGE SIZE MODELS

A Thesis

by

JEANNINE PAOLA TAMEZ

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Approved by:

Chair of Committee,	Antonio Cepeda-Benito
Committee Members,	Marisol Perez
	Louis Tassinary
Head of Department,	Leslie Morey

May 2008

Major Subject: Psychology

ABSTRACT

Social Comparison Test Using Women's Subjective and Physiological Reactivity to
Thin and Average Size Models. (May 2008)

Jeannine Paola Tamez, B.A., Our Lady of the Lake University

Chair of Advisory Committee: Dr. Antonio Cepeda-Benito

The current study examined the subjective and physiological reactivity to body image stimuli among females engaging in a social comparison task. Study I was conducted to select images of thin and average size models and neutral objects for Study II. For Study II, fifty-six female undergraduate students had their skin conductance and startle reflex responses recorded while comparing themselves to images featuring thin models, average size models, and neutral objects. Following the visual presentation, participants rated every image using the Self-Assessment Manikin (SAM) rating scale. Analysis from the SAM ratings scale revealed a significant picture type effect for arousal, dominance, and body satisfaction, indicating that participants reported greater arousal, more body dissatisfaction, and less control after viewing images of thin models than after viewing images of normal models and neutral objects. With regards to the psychophysiological data, results indicated that startle reflex responses were inhibited during the presentation of thin models in comparison to average size models and neutral objects. Moreover, startle reflex responses were inhibited for average size models in comparison to neutral objects. The finding that startle reactivity to model images was inhibited with respect to neutral images suggests pictures of models were processed

affectively as pleasant, positive stimuli. The finding that startle reactivity to thin models was inhibited with respect to average size models suggests that thin model images elicited differentially greater positive affect than average size models. For skin conductance, analysis revealed no significant picture type effect. Taken together, the results of this study highlight the influence of social comparison processes on affectivity reactivity to body image. Future research directions are discussed.

DEDICATION

To my parents

ACKNOWLEDGMENTS

I would like to thank my committee chair, Dr. Antonio Cepeda-Benito, and my committee members, Dr. Marisol Perez and Dr. Louis Tassinari, for their invaluable guidance, time, and encouragement throughout the course of this project. I would also like to extend my deepest gratitude to the undergraduate research assistants that worked diligently on this project. Thanks also to my friends and colleagues for making my time at Texas A&M University such an amazing experience. I would like to thank my better half, Mike, for his patience, love, and support throughout this whole process. Most importantly, I would like to thank my parents (Mami y Papi) and siblings, Jorge, Jeanett, and Joanna, for always believing in me and making me feel like I can conquer the world.

TABLE OF CONTENTS

	Page
ABSTRACT.....	iii
DEDICATION.....	v
ACKNOWLEDGMENTS.....	vi
TABLE OF CONTENTS.....	vii
LIST OF TABLES.....	viii
LIST OF FIGURES.....	ix
INTRODUCTION.....	1
Current Study and Hypotheses.....	7
STUDY I.....	8
Method.....	8
Results.....	10
STUDY II.....	12
Method.....	12
Results.....	21
CONCLUSION AND DISCUSSION.....	24
REFERENCES.....	29
APPENDIX.....	36
VITA.....	46

LIST OF TABLES

TABLE		Page
1	Descriptive statistics- Means and standard deviations for mood and eating disorder related measures.....	36
2	Correlation matrix for SAM rating scale and eating disorder related measures.....	37
3	Means and standard deviations for SAM ratings for each picture category.....	38
4	Startle magnitude means and standard deviations for each picture category.....	39
5	Skin conductance means and standard deviations for each picture category.....	40

LIST OF FIGURES

FIGURE		Page
1A	SAM rating of valence (with standard error bars) across all picture categories.....	41
1B	SAM rating of arousal (with standard error bars) across all picture categories.....	42
1C	SAM rating of dominance (with standard error bars) across all picture categories.....	43
1D	SAM rating of body satisfaction (with standard error bars) across all picture categories.....	44
2	Standardized startle magnitude (with standard error bars) across all picture categories.....	45

INTRODUCTION

Overwhelming concerns over weight, particularly among women, have led Americans to spend over 40 billion dollars annually on dieting products (National Eating Disorders Association [NEDA], 2002). This ever growing preoccupation with weight and body shape has lead many women to engage in drastic weight-control practices, including purging, excessive exercising, and chronic use of laxatives and diet pills (Vogeltanz-Holm, Wonderlich, Lewis, Wilsnack, Harris, Wilsnack, & Kristjanson, 2000). This obsession with weight and body shape can have damaging social, psychological, and health effects, such as the development of eating disorders and their consequences.

Several investigators have identified that low self-esteem, poor coping skills (Mayhew & Edelmann, 1989), acculturative stress (Perez, Voelz, Pettit, & Joiner, 2001), perfectionism (Thomas, Keel, & Heatherton, 2005), fear of being fat, internalization of the thin-ideal, and body image dissatisfaction (Shisslak & Crago, 2001; Stice & Shaw, 1994) constitute the main spectrum of eating disorders risk factors. Similarly, affective disturbances have also been implicated as high risk factors for the development of eating disorders (Stice, 2001), resulting in eating disorders being highly co-morbid with depression (Perez, Joiner, & Lewinsohn, 2003). Although body dissatisfaction, defined as a negative perception of one's physical appearance, is somewhat normative among women, high levels of body image dissatisfaction are highly prevalent among eating

This thesis follows the style and format of the Journal of Consulting and Clinical Psychology.

disorder populations (Rodin, Silberstein, & Streigel-Moore, 1984; Heinberg, Thompson, & Matzon, 2001).

Researchers have sought to examine the various precursors influencing the development of body image dissatisfaction and disordered eating patterns among women. One explanation widely accepted is that Western cultural ideals of attractiveness promote exaggerated thinness among females. The sociocultural theory posits that failures to achieve unrealistic or idealized social standards of beauty results in body image dissatisfaction, which in turn may drive women to engage in extreme body altering behaviors to achieve the ideal body (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Given that Western society equates thinness in women with beauty and success and that the importance of physical beauty is generally greater for women, the sociocultural theory can explain the higher prevalence of negative body image and eating disorders in women than men (Thompson et al., 1999).

To a great extent, researchers investigating social and cultural influences on body image have focused on the potential impact of the “thin ideal” that is portrayed in the various communication media outlets, such as music videos, commercials, print ads, and magazines (Groesz, Levine, & Murnen, 2002; Heinberg & Thompson, 1995). Media outlets tend to portray the female body as an object of desire, which may drive women to high levels of self-consciousness and set unrealistic expectations of physical beauty (Groesz, Levine, & Murnen, 2002). In assessing the impact of the pervasiveness of dietary advertisements and the presence of very thin models in commercialized media, researchers have found that exposure to fashion and beauty magazines was positively

correlated with internalization of sociocultural standards of appearance, body dissatisfaction, negative mood, dieting practices, and disordered eating (Lokken, Worthy, & Trautmann 2004; Morry & Staska, 2001; Tiggeman, Verri, & Scaravaggi, 2005; Stice & Shaw, 1994).

However, Thompson, Heinberg, Altabe, and Tantle-Duff (1999) noted that not all women are equally affected by media exposure to the thin-ideal. A growing body of literature has used *Social Comparison Theory* to explain why the thin-ideal portrayed in the media may affect individuals to varying degrees. According to Social Comparison Theory, individuals have an innate tendency to judge their own abilities by comparing themselves with others (Festinger, 1954). In general, individuals prefer to compare themselves to others that are not too divergent from their own abilities because those similar in attributes serve as a good frame of reference (Miller, Turnbull, & McFarland, 1988). For example, in a study looking at dietary restraint, extreme weight loss behaviors, and binge eating among peer cliques, Paxton, Schutz, Wertheim, and Muir (1999) reported that adolescent girls who reported high body image concerns and high frequency of engaging in weight loss practices were highly inclined to compare their bodies, as well as to talk about weight loss strategies, with their female friends.

Central to the social comparison theory is the prediction that individuals will make either upward or downward social comparisons. In upward social comparisons, individuals measure themselves against those they feel are superior on the targeted attribute or dimension. Conversely, in downward social comparisons, individuals measure themselves against those they feel are inferior on the targeted attribute or

dimension. Upward comparisons are associated with increases in negative affect and decreases in self-esteem (Thompson et al., 1999), whereas downward comparisons are often associated with increases in positive affect and self-esteem (Buunk, Collins, Taylor, VanYperen, & Dakof, 1990; Thompson et al., 1999). With regards to body shape and size, women generally report that their “ideal” body is thinner than their actual body size (e.g., Williams, Gleaves, Cepeda-Benito, Erath, & Cororve, 2001). Therefore, most women who judge themselves against thinner women are very likely engaging in upward social comparison, whereas women who measure themselves against heavier women are likely engaging in downward social comparison. Congruent with an upward comparison effect, most correlational studies have found that upward comparison tendencies in women translate into lower body image satisfaction (see Thompson et al., 1999).

Tests of social comparison theory applied to body image satisfaction have often found that exposure to thin model manipulations usually result in increases in body image dissatisfaction and negative mood. For example, Cattarin, Thompson, Thomas, & Williams (2000) had college women view a 12-minute segment of television commercials featuring models who were either representative or not representative of the “thin-ideal.” Participants were given one of three instructional sets: to compare themselves to the models (comparison condition), focus on the products being advertised (distracter condition), or simply view the commercials (neutral condition). The authors found that regardless of the instructional set given, participants who watched commercials featuring thin and attractive models reported greater self-to-model

comparisons, depressed mood, and anger than women who watched commercials devoid of thin models.

In a more recent study, Tiggemann and McGill (2004) found that women experienced greater body image dissatisfaction after looking at thin models than after viewing neutral images. Similarly, Tiggemann and Slater (2004) found that women reported increases in body image dissatisfaction after watching music video clips featuring thin and attractive women versus ordinary people. However, mood was not affected by either the experimental or control video condition. Likewise, Krones et al. (2005) found that participants interacting with a female confederates conforming to the thin-ideal reported decreases in body satisfaction but not in mood.

In contrast to these findings, other studies have found a small or no effect on body satisfaction after acute exposure to thin ideal models compared to average size models or control conditions (Groesz, Levine, & Murnen, 2002; Champion & Furnham, 1999; Posavac, Posavac, & Posavac, 1998). For example, Posavac, Posavac, and Posavac (1998) reported that women who were relatively satisfied with their body size were less likely to report heightened weight concerns after viewing images of thin models. A more recent study by Champion and Furnham (1999) failed to find a significant difference in body satisfaction after adolescent girls (ages 12-16) viewed images of thin models, overweight individuals, or neutral objects.

Whereas most research on body image has employed subjective measures to assess affective reactivity and body satisfaction in response to presentations of thin models, there have been a few studies that have assessed physiological reactivity while

participants were exposed to images of their own bodies. These studies have relied on Lang's biphasic theory of emotion to better understand affective responses to body image. Lang (1995) proposed that organisms engage in either approach/consummatory or avoidance/defensive reflexive processes in response to appetitive/pleasant or aversive/threatening stimuli, respectively. In support of their theory, Lang and colleagues found that defensive reflexes, such as the eye blink reflex produced by a startling noise, are inhibited while individuals view positive-valence/pleasant stimuli, but potentiated while individuals view negative-valence/unpleasant stimuli. (Lang, Bradley, & Cuthbert, 1998).

Buck, Hillman, Evans, and Janelle (2004) recorded startle responses and facial EMG in 32 females participants who viewed pictures of themselves, as well as positive, negative, and neutral affect pictures. Exposure to their own pictures inhibited their startle responses and zygomatic EMG activity, suggesting that participants responded as if they had been exposed to images that evoke positive affect (see Lang, 1995). Seemingly paradoxically, the participants reported somewhat elevated scores in both eating disorder symptoms and social-anxiety about their physique. Another study by Overduin, Jansen, and Eilkes (1997) measured physiological reactivity (i.e. heart rate, skin conductance, startle response, and facial EMG activity) in restrained and non-restrained eaters who viewed pictures of themselves, favorite binge food items, and neutral stimuli. The authors found that restrained and non-restrained eaters did not differ according to startle reflex responses or facial EMG activity when viewing self-pictures; however, both groups did show increased heart rate activation and skin conductance recovery time

when viewing self-pictures, suggesting that restrained and non-restrained eaters experienced more negative arousal while viewing self-pictures than food items and neutral stimuli.

Current Study and Hypotheses

Many studies have reported body image dissatisfaction and negative mood in response to manipulations that promote upward social comparison to thin female models. These studies have relied solely on self-report measures to capture how females feel about their bodies when engaging in upward or downward social comparison processes. However, no study to date has indexed affective physiological reactivity while participants engaged in upward or downward social comparisons with regard to their body image. The main aim of this study is to incorporate Lang's startle paradigm with an upward social comparison task and measure affective responses to body image stimuli through physiological measures (i.e. startle eye blink reflex and skin conductance). A goal of the study is to test whether Lang's defensive reflex paradigm can index differential physiological responding while participants view body images of thin and average size models. Given that previous research has shown that exposure to thin models has a negative impact in self-reported affect, self-esteem, and body satisfaction, startle reflex responses should be potentiated during thin model exposure in comparison to images of average size models and neutral objects.

STUDY I

Study 1 was designed to develop and select the stimuli that would be used in Study 2, which aims to assess differential physiological reactivity to thin models, average size models, and neutral objects among female college students engaging in a social comparison task. Undergraduate female students were asked to rate advertisements of female models on the dimensions of attractiveness, closeness to the thin-ideal, and closeness to the average woman's body shape. Participants were also asked report their reactivity to the models along the dimensions of mood, arousal, and feelings of dominance and control. It was hoped that the above procedures would allow for the selection of stimuli that could be classified as representative of the "thin ideal" and the "average size" for women, with the images in both categories matched in valence and arousal. Additionally, participants were asked to report their reactivity to neutral images along the dimensions of mood, arousal, and dominance.

Method

Subjects

Fifty-seven female students from introductory psychology classes participated in this study in exchange for research participation credit. The age of the participants ranged from 18 to 23 ($M = 18.36$, $SD = 0.84$). Most of the participants self-identified either as Caucasian ($n = 47$), followed by Hispanic/Latino ($n = 7$), and Asian/Pacific Islander and Black ($n = 1$, respectively). One participant failed to report her ethnicity.

Materials

Sixty advertisements featuring female models of varying sizes were selected from several women's beauty, fashion, and health magazines such as *Glamour*, *Cosmopolitan*, *Allure*, *Vogue*, *Self*, *Shape*, and *Redbook* and from the Internet. The images selected displayed at least half of the female's body from the waist up and did not contain more than one model. Any logos and brand names within the images were covered to reduce the number of distracters. An additional set of thirty advertisements featuring neutral objects (such as household products or automobiles) were also selected.

Measures

Self-Assessment Manikin (SAM; Lang, 1980). The SAM rating scale asks participants to rate the affective quality of visual stimuli for valence (ranging from completely happy to completely unhappy), arousal (ranging from completely aroused to completely calm) and dominance (ranging from completely controlled to completely in-control) along a 9-point scale. Each dimension has 5 figures which represent varying intensity levels of the dimension being measured. Participants are instructed to place an X over any or in between the SAM figures that best represent their emotional experience while observing any given visual stimulus. Scores on the SAM rating scale for valence and arousal have been found to have near perfect agreement with scores on lengthier, self-report measures of emotional reactivity (e.g., Bradley & Lang, 1994). There is evidence of strong associations between valence and arousal scores and physiological and behavioral measures of similar constructs (Bradley & Lang, 1994).

Image Rating Form (IRF). Developed for the purpose of the present study, the IRF consists of five, 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*) items that serve to rate and compare different female models along the dimensions of attractiveness, thin-ideal, and the average female body shape. Two additional filler items, which asked whether participants felt the product being advertised was interesting and if the advertisement was effective, were included to go along with the cover story and help reduce demand characteristics.

Procedure

Upon arrival to the laboratory, participants in groups of ten each signed a consent form, answered two questions regarding demographics (age and ethnicity), and were told that they would be viewing and rating several advertisements along several dimensions. Participants were then given oral instructions on how to rate the female models using both the Image Rating Form and SAM rating scale and told to only use the SAM rating scale when rating images featuring neutral objects. Each participant viewed a visual presentation consisting of 90 images individually presented for 30 seconds on PowerPoint slides. At the end of the image rating task, participants were debriefed on the true purpose of the experiment.

Results

Ratings for the female models were initially analyzed for participant agreement on body shape and attractiveness. Using scores from the IRF, a criterion cut-off score of 4 (*Agree*) or 5 (*Strongly Agree*) for three of the questions (how much the model represented our society's standard of ideal beauty, how attractive the model was, and

how much the model's body shape was representative of the average woman's body shape) was used to calculate inter-rater reliability. Images rated with a score of 4 or 5 as conforming to the thin-ideal by 70% or more of participants were placed in the thin models category whereas images with an inter-rater reliability of at least 70% for being representative of the average size women were placed in the average size models category. Next, to further ensure that the images chosen for the average size model category were representative of the average size woman, the images also had to have been rated with a score of 2 (*Disagree*) or lower (1= *Strongly Disagree*) as conforming to the thin-ideal by 70% or more of participants.

In addition to body shape, an attempt was made to match images in the thin model and average size model category on attractiveness. However, this proved to be difficult since thin models were rated more attractive than average size models ($M = 4.52$, $SD = 0.36$ for thin models and $M = 3.77$, $SD = 0.78$ for average size models). An attempt was also made to match images in both of these categories on valence and arousal levels. Images having a mean for valence between 4.5 and 8.5 ($M = 6.19$, $SD = 1.43$ for thin models and $M = 5.64$, $SD = 0.85$ for average size models) and a mean for arousal between 3.5 and 6.5 ($M = 5.57$, $SD = 1.61$ for thin models and $M = 3.95$, $SD = 1.25$ for average size models) were included. This process resulted in 10 images being placed in the thin model category and 10 images in the average size model category. Lastly, images featuring neutral objects had to have a mean for valence between 4.5 and 6.0 ($M = 5.34$, $SD = 0.90$) and a mean for arousal between 3.5 and 6.5 ($M = 3.95$, $SD = 1.25$). This resulted in 10 images being placed in the neutral objects category.

STUDY II

Method

Subjects

Fifty-six female undergraduate students from introductory psychology classes participated in this study in exchange for research participation credit. Three subjects were excluded from final analysis due to a general lack of startle response and one subject was excluded due to experimenter error. The ages of the remaining fifty-two participants ranged from 18 to 27 years ($M = 19.29$, $SD = 1.49$). With regards to weight, 55.8% of the participants considered themselves to be of normal weight, 42.3% reported feeling overweight, and 1.9% reported feeling underweight. Their body mass indexes (BMI, weight [kg]/height [cm]²) ranged from 19.47 to 34.54 ($M = 23.79$, $SD = 3.36$). Like in Study 1, most of the participants self-identified as Caucasian ($n = 40$), with Hispanic/Latino being the second most numerous group ($n = 8$). One participant self identified as Black/African American and three participants chose the *other ethnicity* category.

Materials

Visual Stimuli. A collection of thirty color pictures were presented on a 25-inch computer monitor (Barco Multidata OCM 3346) at a distance of 1.5 meters from the subject. The content of the pictures varied across three categories with ten pictures per category. The three picture categories consisted of: thin models, average size models, and neutral objects. The images featuring models that were used in this study were

categorized into thin-ideal and average-size and matched on valence based on the results of Study 1. All three categories were matched on self-perceived arousal.

Self-report Measures

Demographics and Food Questionnaire. Participants gave information regarding age, ethnicity, weight, height, perception of weight (i.e. underweight, normal weight, overweight), current medication use, and three hour recall of what they ate prior to the testing session.

Positive Affect Negative Affect Schedule (PANAS; Watson, Clark, & Tellegan, 1988). The PANAS, a 20 item scale, measures subjective positive and negative mood states. Participants were asked to rate how they are currently feeling on a scale of 1 to 5 (1= *very slightly or not at all* and 5= *extremely*). Scores on the PANAS have been found to have good reliability, as well as convergent and discriminant validity with scores on other mood measures, including the Beck Depression Inventory, the Hopkins Symptom Checklist, and the STAI State Anxiety Scale (Watson, Clark, & Tellegan, 1988). For this study, Cronbach's alpha was 0.81 for positive affect and 0.76 for negative affect.

Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ; Heinberg, Thompson, & Stormer, 1995). The SATAQ is a 14-item questionnaire used to measure perceived social standards of beauty and perceived importance of physical appearance in social advancement and success. The items are scored along a 5-point Likert scale (1 = *completely disagree* to 5 = *completely agree*) and grouped into two subscales, Awareness and Internalization. Awareness measures the degree to which individuals are aware of sociocultural norms, whereas internalization measures the extent to which

individuals accept these standards. Non-eating disordered individuals tend to have a mean score of 18.1 (SD = 3.9) for the Awareness subscale and a mean score of 24.1 (SD = 6.0) for the Internalization subscale (Griffiths, Beumont, Russell, Schotte, Thornton, Touyz, & Varano, 1999). Heinberg et al. (1995) reported high reliability coefficients of $\alpha = 0.88$ for the scores of the internalization subscale and $\alpha = 0.71$ for the scores of the awareness subscale with a sample of undergraduate women. The reliability estimate for the present sample was 0.77 for the Internalization subscale and 0.68 for the Awareness subscale.

Rosenberg Self Esteem Inventory (RSEI; Rosenberg, 1979). The RSEI is a 10-item scale used to measure global self-esteem. Participants were asked to rate how true each statement is along a 4-point Likert scale (0 = *strongly agree* to 4 = *strongly disagree*). Items were reverse-scored such that higher scores were indicative of more positive global self-esteem. Studies have reported satisfactory internal consistency ($\alpha = 0.72-0.92$) and temporal reliability (test-retest $r = 0.85$) (Rosenberg, 1979). Cronbach's alpha for the present sample was 0.88.

Bulimia Test-Revised (BULIT-R; Thelen, Farmer, Wonderlich, & Smith, 1991). The BULIT-R is a 36-item questionnaire used to measure symptoms of bulimia along a 5-point Likert scale. However, only 28 of the 36 items are used for scoring purposes. Scores on the BULIT-R have been found to exhibit high internal consistency ($\alpha = 0.98$) and correlate with the severity of bulimic symptoms (Thelen et al., 1996). Higher scores (104 or above) are indicative of a higher likelihood that an individual may be diagnosed

with bulimia in a clinical interview. For this study, the reliability estimate of the scores in the present sample was 0.94.

Eating Attitudes Test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982). The EAT, a 26 item scale, measures anorexia nervosa symptoms such as preoccupation with food, oral control over eating, dieting behavior, and bingeing/purging. Participants are asked to rate each item along a 6-point Likert scale (0 = *never* to 6 = *always*). The EAT has been found to be a reliable, valid measure of the symptoms of anorexia nervosa (Garner, Olmstead, Bohr, & Garfinkel, 1982). Full scale scores range from 0 to 20, with higher scores indicating a higher presence of disturbed eating patterns and eating disorder symptomatology. For the present sample, Cronbach's alpha was 0.85.

Iowa-Netherlands Comparison Orientation Measure (INCOM; Gibbons & Buunk, 1999). The INCOM, an 11 item scale, measures individual differences in social comparison processes. Participants were asked to rate the extent to which they compare themselves with others along a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*). The INCOM has two subscales, ability and opinions, and good psychometric properties (Gibbons & Buunk, 1999). The reliability estimate of the scores in the present sample was 0.66.

Body Image Assessment (BIA; Williams, Gleaves, Cepeda-Benito, Erath, & Cororve, 2001). The BIA consists of 9 silhouettes ranging in sizes from very thin to very large. The BIA required participants to identify which body shape best approximates their current body shape and ideal body shape. The discrepancy between current body shape and ideal body shape indicated the degree of body image dissatisfaction. Williams

and colleagues (2001) found satisfactory test-retest reliability for current body shape ($r = 0.9$) and for ideal body shape ($r = 0.71$). Gleaves et al. (2001) reported good test-retest reliability for the group administered version and good concurrent validity with the individual administration format of the BIA, suggesting that the group administered version is an easy and efficient alternative to the original, individual format of the BIA.

Self-Assessment Manikin (SAM; Lang, 1980). The SAM rating scale asks participants to rate the affective quality of visual stimuli for valence (ranging from completely happy to completely unhappy), arousal (ranging from completely aroused to completely calm) and dominance (ranging from completely controlled to completely in-control) along a 9-point scale. An additional dimension, body satisfaction (ranging from completely satisfied to completely dissatisfied with body shape), was added for this study to capture how participants felt about their bodies while viewing each image. Each dimension has 5 figures which represent varying intensity levels of the dimension being measured. Participants were instructed to place an X over any of the figures or in between the figures that best represents their emotional experience while viewing the visual stimulus. Scores on the SAM rating scale for pleasure and arousal have near perfect agreement with scores on a lengthier, verbal measure of emotional reactivity, the Semantic Differential scale, proving that the SAM ratings scale is an easy and efficient way to measure subjective emotional responses with a variety of stimuli (Bradley & Lang, 1994). There is evidence of strong associations between valence and arousal scores and physiological and behavioral measures of similar constructs (Bradley & Lang, 1994).

Physiological Measures

Defensive Reflex. The defensive reflex measured was the startle (eye blink) response, which was used as an index of affective responding to visual stimuli. The eye blink response was assessed as EMG activity using the MP100 System (Biopac, Goleta, CA) data recorder. Two 4mm Biopac Ag-AgCl electrodes filled with electrode gel (Signa Gel) were secured on the orbicularis oculi region below the left eye. Impedance was then checked using the UFI 1089 mk III Checktrode, and an effort was made to have impedance readings below 15 ohms. The raw EMG signal was amplified, filtered (bandpass = 10-500Hz), and integrated using EMG100 and the AcqKnowledge 3.5 software (Biopac, Goleta, CA). The data was edited off-line to detect any clear movement artifact. Each startle score for any given trial was the difference of the peak amplitude of EMG between the 20 ms to 120 ms interval after the probe onset minus the mean baseline EMG activity recorded during the second prior to the picture onset. Trials where the waveform suggested too much baseline activity or clear movement artifact in the startle response were considered a zero-response trial and not included in the analyses (zero-response trials < 7%). Each startle response was converted to a z score (using the mean and standard deviation for that particular participant's startle response), and then transformed to a T score ($[z \times 10] + 50$) (Drobes et al., 2001).

Skin Conductance. To measure skin conductance, leads filled with Grass Electrode paste were placed on the middle phalanges of the participant's index and middle finger, amplified using the GSR100 amplifiers, and recorded using AcqKnowledge 3.5 software. AcqKnowledge 3.5 converted the pulse signal into BPM

through a calculation function. Skin conductance was scored offline, and each image viewing period was divided into 1 second time intervals with an additional 1 second time interval extending past the image viewing period due to the latency of the sweating response. The mean BPM of the second preceding the onset of each image exposure trial was used as the baseline. The skin conductance score for any trial was the difference between its peak and baseline BPM.

Procedures

Participants were recruited through the psychology department's subject pool website. Upon signing up for the experiment through the webpage, all participants were asked not to consume any caloric or caffeine beverages three hours prior to their scheduled testing session. Participants were told that the three hour fasting period was necessary to facilitate the recording of their physiological responses and that a glucose blood test would be conducted to verify compliance. Once arriving to the laboratory, participants were greeted by a female research assistant and asked to complete a battery of questionnaires: demographics and food form, PANAS, menstrual calendar and form, SAQAT, BIA, EAT-26, RSEI, INCOM, and the BULIT-R. After completing the questionnaires, participants were asked to provide a blood sample, which was collected using the Bayer Dex Meter Glucometer. All participants reported blood glucose levels between 51 and 130 mg/dL, and none were excluded from the study.

After completing the glucose test, participants were asked to rinse and dry their hands and sit in a comfortable recliner. Their face was then prepared for electrode placement and attached according to established guidelines (Blumenthal, et al., 2005).

Participants were then given instructions to sit still and view each image while comparing themselves to the people in the images for the entire presentation period. They were told to focus on what the people look like and what they are wearing. To increase compliance with the instructions, participants were also told that half of the participants would be randomly assigned to a memory task and asked to recall the images they saw. Lastly, participants were told to ignore the noises that would come from the headphones. After the instructions were given, the lights in the room were dimmed, headphones were put in place, and baseline physiological data was collected for 10 minutes while the participant relaxed. Following the 10-minute accommodation period, exposure to thin models, average size models, and neutral objects occurred while eye-blink responses and skin conductance was recorded.

The acoustic startle stimulus consisted of a 100dB (A) white noise burst presented for 50 milliseconds over Sennheiser EH2270 headphones. The white noise was produced by Cool Edit 2002 (Syntrillium, Phoenix, AZ) with instantaneous rise time. The images were presented in five pseudo-randomized orders, where each picture was shown for 6 seconds and followed by a 10 second blank (white background) inter-trial intervals. To reduce the predictability of the startle stimulus, the stimulus was presented randomly at 2.5, 4, or 5 seconds after the picture onset and only during 6 of the 10 pictures per picture category. Additionally, 7 startle probes were presented randomly during inter-trial intervals. The presentation and timing of the pictures and startle probes were controlled by Superlab software (Cedrus Corporation, San Pedro, CA).

At the end of the visual presentation, all electrodes were removed and participants filled out the PANAS for a second time. The images were then shown again in groups of three, with all the pictures in each group corresponding to the same type of picture (i.e., thin models, average size models, and neutral objects). Participants were asked to rate all the pictures using the SAM rating scale. Each picture group was shown for 6 seconds and, after each block presentation, participants were given 15 seconds to rate each picture group along dimensions of valence, arousal, dominance, and body satisfaction.

After the picture rating task, participants were told that to gather all their belongings because the testing session was over. During this time, the research assistant stated that they forgot to make a copy of the debriefing form and needed to make a copy to give to the participant. Before leaving the laboratory to make a copy of the form, the research assistant told the participant that they were free to grab a snack. An assortment of sweets, fruits, vegetables, and salty snacks were haphazardly placed in a bowl located toward the front of the room. The research assistant returned to the laboratory after five minutes and debriefed the participant as to the true purpose of the experiment. Once the participant left the laboratory, the research assistant recorded how much food was taken from the bowl. Although this amount would give an index of food consumption following a social comparison task, it will not be analyzed for this project because it is beyond the scope of the current research question being asked.

Statistical Analysis

All analyses were conducted using the SPSS version 15.0 statistical package. SAM ratings for each of the four dimensions assessed (affective valence, dominance, arousal, and body satisfaction), startle responses, and peak skin-conductance values were subjected to separate repeated measures ANOVAS, with picture type (thin models, average size models, and neutral objects) as the within subjects factor. To control for deviations from the sphericity assumption, the degrees of freedom associated with the within factor were adjusted using the Greenhouse-Geisser correction for all of our repeated measures analysis. Statistically significant effects were followed by paired *t*-test comparisons.

To facilitate the presentation of the results, valence, arousal, and body satisfaction SAM-scores were reversed so that high values would be indicative of positive mood, high arousal, and high body satisfaction. Direct SAM-dominance scores were indicative of high perceived control. Statistical significance was set at $\alpha \leq .05$.

Results

Subjective Variables

Table 1 summarizes the means and standard deviations for the self-report measures and other sample descriptive variables, and Table 2 is the correlation matrix for this same set of variables, including SAM ratings for each dimension for thin and average size models. Table 3 has the means and standard deviations for the SAM ratings for each dimension and picture category. Figures 1A-1D depict the results for the within subjects ANOVAs comparing mean scores across the three types of stimuli.

There was not a statistically significant picture effect for valence, $F(2, 90) = 2.82, p = 0.08, \eta^2 = .059$ (see Figure 1A). Although attempts were made to match the pictures on self-reported arousal, there was a significant picture effect for arousal, $F(2, 92) = 18.4, p < 0.0001, \eta^2 = .285$. Figure 1B shows that participants reported greater arousal after viewing images of thin models than average size models, $t(47) = 4.05, < .001, d = 0.58$, and greater arousal after viewing average-size models than neutral images, $t(47) = 2.48, p < .02, d = 0.36$. There was also a significant picture effect for dominance, $F(2, 90) = 12.2, p < 0.001, \eta^2 = .213$. Figure 1C shows that participants reported feeling less in control after their exposure to thin model images than average size models, $t(46) = 4.22, < .001, d = 0.62$, and neutral images, $t(47) = 3.78, p < .001, d = 0.55$. However, participants reported similar feelings of control after viewing average size models and neutral images, $t(47) = 0.91, p = .37, d = 0.13$.

Finally, there was a statistically significant picture effect for body satisfaction, $F(2, 86) = 15.3, p < 0.0001, \eta^2 = .262$. Figure 1D shows that participants reported feeling considerably less satisfied about their own body image after being exposed to thin model images than average size model images, $t(45) = 4.26, < .001, d = 0.63$, and neutral images, $t(45) = 3.12, p < .01, d = 0.46$. Moreover, participants reported significantly higher body image satisfaction after viewing average size model than neutral objects, $t(44) = 3.06, p < .01, d = 0.45$. That is, women reported slightly negative and positive self-assessments of their bodies after viewing thin models and average size models respectively.

Psychophysiological Data

Startle. The repeated measures ANOVA revealed a significant picture effect for the startle eye blink response, $F(2, 102) = 7.07, p < 0.01, \eta^2 = .122$. Means and standard deviations are presented in Table 4. Figure 2 shows that startle responses were inhibited during the presentation of images of thin models with respect to the startle responses recorded during the presentation of average size models, $t(51) = 1.95, p = .05, d = 0.27$, and with respect to neutral images, $t(51) = 3.04, p < .001, d = 0.47$. Moreover, startle responses while viewing images of average size models were inhibited with respect to startle responses recorded while participants viewed neutral images, $t(51) = 2.00, p = .05, d = 0.28$. The finding that startle reactivity to model images was inhibited with respect to neutral images suggests pictures of models were processed affectively as pleasant, positive stimuli. The finding that startle reactivity to thin models was inhibited with respect to the startle to average size models suggests that thin model images elicited differentially greater positive affect than average size models.

Skin Conductance. For skin conductance, the repeated measures ANOVA did not reveal a significant picture effect for skin conductance, $F(2, 96) = 1.85, p = 0.16$. The means and standard deviations are presented in Table 5. This finding suggests that there was no statistical difference in terms of arousal level while participants viewed images of thin models, average size models, and neutral objects. The lack of difference in arousal might be due to the fact that the images were pre-selected to have similar levels of self-perceived arousal.

CONCLUSION AND DISCUSSION

This was the first study to incorporate Lang's startle reflex paradigm to an upward social comparison manipulation that researchers use often to investigate a theorized negative effect of media messages on female body image satisfaction. More specifically, we monitored and compared the amplitude of the startle reflex and skin conductance responses in young women exposed to images of thin models, average size models, and neutral objects.

Consistent with previous upward social comparison manipulations applied to body-image satisfaction, female participants reported feeling less satisfied with their body after viewing pictures of thin models than after viewing either average size models or neutral objects. Moreover, participants indicated they felt more satisfied with their body after viewing average size models than after viewing neutral objects. Taken together, these findings are congruent with social comparison theory, which predicts that individuals will feel inferior or inadequate when they judge themselves against others who are considered superior in the compared dimension (thinness), but will experience positive affect when measuring up against those thought to be equal or inferior with regard to the targeted attribute (Thompson, Heinberg, Altabe, & Tantle-Duff, 1999). Thus, the experimental manipulation replicated the finding that media exposure to thin models can provoke body image dissatisfaction in girls and women (Groesz, Levine, & Murnen, 2002; Heinberg & Thompson, 1995; Krones, Stice, Batres, & Orjada, 2005).

In contrast to prior investigations, participants reported similar levels of negative-to-positive affect valence across thin models, average size models, and neutral objects.

That is, when asked how they felt as they watched the images presented to them, participants did not report being negatively affected by the thin-model images. It appears that the negative effect of an upward social comparison to thin models manipulation in a sample of young and “healthy” women, at least with regard to eating disorder symptoms and body-image satisfaction (see Table 1), was circumscribed to body image satisfaction. This finding suggests the presence of two potential confounds in previous upward social comparison studies and may explain the inconsistency of results reported across various studies. One possibility is that upward social manipulation effects could be differentially impactful as a function of baseline body image concerns. That is, baseline body image could be a moderator variable such that only women high in body image dissatisfaction would report decreases in self esteem and overall mood after being exposed to images of thin models (Posavac, Posavac, & Posavac, 1998; Hausenblas, Janelle, Gardner, & Hagan, 2002; Bessenoff, 2006). Another possibility might be that upward social comparison effects are circumscribed to body image specific effects in women. This would mean that studies that have reported negative effects of upward social comparison manipulations on general measures of affect and self-esteem may have inadvertently asked participants to report the impact of the thin model exposure manipulation with regard to effects on their body image satisfaction rather than on their overall affect and self-esteem.

With regards to arousal and dominance, participants reported feeling more aroused and less in control while viewing images of thin models in comparison to average size models or neutral objects. Lower dominance ratings for thin models appear

to have greater congruence with effects on body satisfaction than with valence. Similarly for arousal, higher arousal ratings for images of thin models seem to correspond to the slightly lower valence ratings given in comparison to average size models.

In congruence with the negative impact of the upward social comparison effect on body image satisfaction as measured by our adaptation to the SAM, there was evidence of emotional modulation of the startle reflex in response to images of thin models, average size models, and neutral objects. Not surprisingly, startle responses were inhibited for average size models with respect to neutral images. Participants reported higher body satisfaction in response to average size models than neutral objects. However, contrary to our hypothesis and SAM responses to body satisfaction, startle responses were inhibited for thin models with respect to average size models and neutral images. The inhibition of startle responses during exposure to thin models with respect to average size models and neutral objects suggests that women processed images of thin models as positive or pleasant in comparison to how they processed images of average size models and neutral objects. This finding cannot be attributed to differentially elicited levels of physiological arousal between the different conditions, as there were no statistically significant differences in skin conductance.

It is interesting to note that even though women reported feeling more dissatisfied with their body after viewing images of thin rather than average size models, women appeared to react to the images of thin models in a manner indicative of positive affect processing. This seemingly paradoxical effect can be interpreted as congruent with the sociocultural theory of eating disorders and body-image dissatisfaction. The

sociocultural hypothesis of eating disorders purports that social messages that equate extreme thinness in women with the ideal of female beauty contribute to women's desire to conform to an unrealistic thin ideal and consequently be dissatisfied with their own bodies when they are unable to fulfill their unreasonable expectations. Although exposure to the thin ideal can eventually lead to body-image dissatisfaction, the dissatisfaction is the result of failing to achieve a desirable outcome, thinness. Thinness therefore is equated with beauty and is a condition that should engage approach motivational processes, which, when activated, should inhibit the responsiveness of defensive-reflex systems such as the startle response. Thus, it appears that the images of thin models awaken approach motivational states that can be detected at a visceral level, but that provoke dissatisfaction or frustration upon the realization that the desired outcome is out of reach.

Despite the significant findings of the current study, several limitations should be noted. First, this study utilized a within subjects design, thereby increasing the chance of carry-over effects and limiting the ability to draw a casual inference about the influence of social comparison processes. Future research could address this issue by creating a between groups design which would allow for comparisons of physiological reactivity between groups to be made. Second, our sample consisted primarily of Caucasian undergraduate women, which limits the generalizability of the results. Additionally, because the females in our study viewed the images once before rating them, this might have primed them to respond in a certain manner. Lastly, the small sample size limited the power of our effects.

Given these limitations, a major contribution of this research is the application of psychophysiological measures (i.e. startle eye blink reflex and skin conductance) to a social comparison task with images of thin and average size models. By incorporating Lang's theory of emotion with a social comparison task, this methodology provides us with information about the affective component of body image. However, this area warrants more research. In the future, it would be important to incorporate positive and negative affect pictures to see where physiological reactivity to thin and average size models falls with respect to negative and positive affect images. Additionally, it would be beneficial to examine this new methodology with a more diverse sample and to compare gender differences in affectivity reactivity.

REFERENCES

- Bessenoff, G. R. (2006). Can the media affect us? Social comparison, self-discrepancy, and the thin ideal. *Psychology of Women Quarterly*, 30, 239-251.
- Blumenthal, T. D., Cuthbert, B. N., Filion, D. L., Hackley, S., Ottmar, L. V., & van Boxtel, A. (2005). Committee report: Guidelines for human startle eyeblink electromyographic studies. *Psychophysiology*, 42(1), 1-15.
- Bradley, M. M. & Lang, P. J. (1994). Measuring emotion: The self-assessment manikin and the semantic differential. *Journal of Behavior Therapy and Experimental Psychiatry*, 25(1), 49-59.
- Buck, S. M., Hillman, C. H., Evans, E. M., & Janelle, C. M. (2004). Emotional responses to pictures of oneself in healthy college age females. *Motivation and Emotion*, 28(3), 279-295.
- Buunk, B. P., Collins, R. L., Taylor, S. E., VanYperen, N. W., & Dakof, G. A. (1990). The affective consequences of social comparison: Either direction has its ups and downs. *Journal of Personality and Social Psychology*, 59(6), 1238-1249.
- Cattarin, J. A., Thompson, J. K., Thomas, C., & Williams, R. (2000). Body image, mood, and televised images of attractiveness: The role of social comparison. *Journal of Social and Clinical Psychology*, 19(2), 220-239.
- Champion, H. & Furnham, A. (1999). The effect of the media on body satisfaction in adolescent girls. *European Eating Disorders Review*, 7, 213-228.
- Drobes, D. J., Miller, E. J., Hillman, C. H., Bradley, M. M., Cuthbert, B. N., & Lang, P.

- J. (2001). Food deprivation and emotional reactions to food cues: Implications for eating disorders. *Biological Psychology*, 57(1-3), 153-177.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7, 117-140.
- Garner, D.M., Olmsted, M.P., Bohr, Y., & Garfinkel, P.E. (1982). The Eating Attitudes Test: Psychometric features and clinical correlates. *Psychological Medicine*, 12, 871-878.
- Gibbons, F. X. & Buunk, B. P. (1999). Individual differences in social comparison: Development of a scale of social comparison orientation. *Journal of Personality and Social Psychology*, 76(1), 129-142.
- Griffiths, R. A., Beumont, P. J. V., Russell, J., Schotte, D., Thornton, C., Touyz, S., & Varano, P. (1999). Sociocultural attitudes toward appearance in dieting disordered and nondieting disordered subjects. *European Eating Disorders Review*, 7, 193-203.
- Groesz, L. M., Levine, M. P., & Murnen, S. K. (2002). The effect of experimental presentation of thin media images on body satisfaction: A meta-analytic review. *International Journal of Eating Disorders*, 31, 1-16.
- Hausenblas, H. A., Janelle, C. M., Gardner, R. E., & Hagan, A. L. (2002). Effects of exposure to physique slides on the emotional responses of men and women. *Sex Roles*, 47, 569-575.
- Heinberg, L. J. & Thompson, J. K. (1995). Body image and televised images of thinness

- and attractiveness: A controlled laboratory investigation. *Journal of Social & Clinical Psychology*, 14(4), 325-338.
- Heinberg, L. J., Thompson, J. K., & Matzon, J. L. (2001). Body image dissatisfaction as a motivator for healthy lifestyle change: Is some distress beneficial? In R. H. Striegel-Moore & L. Smolak (Eds.), *Eating disorders: Innovative directions in research and practice*. (pp. 215-232). Washington, DC, US: American Psychological Association.
- Heinberg, L. J., Thompson, J. K., & Stormer, S. (1995). Development and validation of the sociocultural attitudes towards appearance questionnaire. *International Journal of Eating Disorders*, 17, 81-89.
- Krones, P. G., Stice, E., Batres, C., & Orjada, K. (2005). In vivo social comparison to a thin-ideal peer promotes body dissatisfaction: A randomized experiment. *International Journal of Eating Disorders*, 38, 134-142.
- Lang, P. J. (1995). The emotion probe. *American Psychologist*, 50, 372-385.
- Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (1998). Emotion, motivation, and anxiety: Brain mechanisms and psychophysiology. *Biological Psychiatry*, 44(12), 1248-1263.
- Lokken, Worthy, & Trautmann. (2004, June). Examining the links among magazine preference, levels of awareness and internalization of sociocultural appearance standards, and presence of eating-disordered symptoms in college women. *Family & Consumer Sciences Research*, 32(4), 361-381.
- Mayhew, R. & Edelman, R. (1989). Self-esteem, irrational beliefs and coping strategies

- in relation to eating problems in a non-clinical population. *Personality and Individual Differences*, 10(5), 581-584.
- Miller, D., Turnbull, W., & McFarland, C. (1988, December). Particularistic and universalistic evaluation in the social comparison process. *Journal of Personality and Social Psychology*, 55(6), 908-917.
- Morry, M. M. & Staska, S. L. (2001, October). Magazine exposure: Internalization, self-objectification, eating attitudes, and body satisfaction in male and female university students. *Canadian Journal of Behavioural Science*, 33(4), 269-279.
- National Eating Disorders Association (2002). Know dieting: Risks and reasons to stop. Retrieved August 22, 2006, from <http://www.nationaleatingdisorders.org/>.
- Overduin, J., Jansen, A., & Eilkes, H. (1997). Cue reactivity to food- and body-related stimuli in restrained and unrestrained eaters. *Addictive Behaviors*, 22, 395-404.
- Paxton, S. J., Schutz, H. K., Wertheim, E. H., & Muir, S. L. (1999). Friendship clique and peer influences on body image concerns, dietary restraint, extreme weight-loss behaviors, and binge eating in adolescent girls. *Journal of Abnormal Psychology*, 108(2), 255-266.
- Perez, M., Joiner, T. E. Jr., & Lewinsohn, P. M. (2003). Is major depressive disorder or dysthymia more strongly associated with bulimia nervosa? *International Journal of Eating Disorders*, 36, 55-61.
- Perez, M., Voelz, Z. R., Pettit, J. W., & Joiner, T. E. Jr. (2001). The role of acculturative stress and body dissatisfaction in predicting bulimic symptomatology across ethnic groups. *International Journal of Eating Disorders*, 31, 442-454.

- Posavac, H. D., Posavac, S. S., & Posavac, E. J. (1998). Exposure to media images of female attractiveness and concern with body weight among young women. *Sex Roles, 38*, 187-201.
- Rodin, J., Silberstein, L., & Striegel-Moore, R. (1984). Women and weight: A normative discontent. *Nebraska Symposium on Motivation, 32*, 267-307.
- Rosenberg, M. (1979). *Conceiving the self*. New York: Basic Books.
- Shisslak, C. M. & Crago, M. (2001). Risk and protective factors in the development of eating disorders. In J. K. Thompson & L. Smolak (Eds.), *Body image, eating disorders, and obesity in youth: Assessment, prevention, and treatment*. (pp. 103-125). Washington, DC, US: American Psychological Association.
- Stice, E. (2001). Risk factors for eating pathology: Recent advances and future direction. In R. H. Striegel-Moore & L. Smolak (Eds.), *Eating disorders: Innovation directions in research and practice*. (pp. 51-73). Washington, DC, US: American Psychological Association.
- Stice, E. & Shaw, H. E. (1994). Adverse effects of the media portrayed thin-ideal on women and linkages to bulimic symptomatology. *Journal of Social & Clinical Psychology, 13*(3), 288-308.
- Thelen, M. H., Farmer, J., Wonderlich, S., & Smith, M. C. (1991). A revision of the bulimia test: The BULIT-R. *Psychological Assessment: A Journal of Consulting and Clinical Psychology, 3*, 119-124.
- Thomas, J. J., Keel, P. K., & Heatherton, T. F. (2005, November). Disordered eating

attitudes and behaviors in ballet students: Examination of environmental and individual risk factors. *International Journal of Eating Disorders*, 38(3), 263-268.

- Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantle-Duff, S. (1999). Social comparison processes. In J. K. Thompson, L. J. Heinberg, M. Altabe, S. Tantleff-Dunn. *Exacting beauty: Theory, assessment, and treatment of body image disturbance*. (pp. 125-147). Washington, DC, US: American Psychological Association.
- Tiggemann, M. & McGill, B. (2004). The role of social comparison in the effect of magazine advertisements on women's mood and body dissatisfaction. *Journal of Social and Clinical Psychology*, 23(1), 23-44.
- Tiggemann, M. & Slater, A. (2005). Thin ideals in music television: A source of social comparison and body dissatisfaction. *International Journal of Eating Disorders*, 35, 48-58.
- Tiggeman, M., Verri, A., & Scaravaggi, S. (2005). Body dissatisfaction, disordered eating, fashion magazines, and clothes: A cross-cultural comparison between Australian and Italian young women. *International Journal of Psychology*, 40(5), 293-302.
- Watson, D., Clark, L. A., & Tellegan, A. (1988). Development and validation of brief measures of positive and negative affect: The panas scales. *Journal of Personality and Social Psychology*, 54(6), 1063-1070.
- Williams, T., Gleaves, D., Cepeda-Benito, A., Erath, S. A., & Cororve, M. B. (2001).

The reliability and validity of a group-administered version of the body image assessment. *Assessment*, 8(1), 37-46.

APPENDIX

Table 1. Descriptive statistics- means and standard deviations for mood and eating disorder related measures

Measures	N	M	SD
PA (pre)	51	27.24	6.26
NA (pre)	51	14.96	4.09
SAQAT-Intern	52	26.29	5.53
SAQAT-Aware	52	21.62	3.06
BIA	52	1.77	1.19
EAT-26	42	11.19	8.63
RSE	52	31.98	4.08
INC	52	39.92	4.36
BULIT-R	51	53.47	17.68

Note: PA= Positive Affect scale of Positive Affect Negative Affect Schedule (PANAS); NA= Negative Affect scale of PANAS; SAQAT-Intern= Internalization subscale of Sociocultural Attitudes Towards Appearance Questionnaire; SATAQ-Aware= Awareness subscale of SATAQ; BIA= Body Image Assessment; EAT-26= Eating Attitudes Test; RSE= Rosenberg Self-Esteem Inventory; INC= Iowa-Netherlands Comparison Orientation Measure; BULIT-R= Bulimia Test-Revised

Table 2. Correlation matrix for SAM rating scale and eating disorder related measures

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. SAQAT-Intern	1	.62	.22	.45**	-.27	.17	.51**	-.08	0.04	.11	-.14	-.38**	-.14	-.17	-.20
2. SAQAT-Aware		1	-.15	.45**	-.27	.17	.02	.11	-.30*	.04	-.18	.25	.30*	.12	-.19
3. BIA			1	.28	.33*	-.19	.39**	-.19	.07	-.07	-.01	-.034*	-.21	-.27	-.31*
4. EAT-26				1	.31*	-.09	.61**	-.16	-.00	.15	.11	-.22	-.23	-.22	-.23
5. RSE					1	-.06	-.5**	-.32	-.15	.19	.14	.19	.05	.24	.26
6. INCOM						1	.03	-.22	-.14	-.21	-.06	.01	-.15	.01	-.18
7. BULIT-R							1	-.27	-.03	.03	.02	-.22	.07	-.31*	-.18
8. VAL_thin								1	.03	.60**	.18	.39**	.09	.80**	.06
9. VAL_avg									1	.18	.19	-.21	-.17	-.29	.612**
10. AR_thin										1	.48**	.06	.20	.54**	-.06
11. AR_avg											1	-.14	-.19	.09	.02
12. DOM_thin												1	.16	.43**	-.05
13. DOM_avg													1	.06	.26
14. BS_thin														1	-.15
15. BS_avg															1

Note: ** Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed). VAL_thin= SAM valence ratings for thin models; VAL_avg= SAM valence ratings for average size models; AR_thin= SAM arousal ratings for thin models; AR_avg= SAM arousal ratings for average size models; DOM_thin= SAM dominance ratings for thin models; DOM_avg= SAM dominance ratings for average size models; BS_thin= SAM body satisfaction ratings for thin models; BS_avg= SAM body satisfaction ratings for average size models

Table 3. Means and standard deviations for SAM ratings for each picture category

Picture Category	Valence		Arousal		Dominance		Body Satisfaction	
	M	SD	M	SD	M	SD	M	SD
Thin Models	4.44	1.89	3.77	2.14	4.60	1.53	3.59	2.07
Average Size Models	5.02	1.59	2.63	1.48	5.79	1.50	5.41	1.61
Neutral Objects	4.33	1.31	2.23	1.60	5.62	1.41	4.84	1.39

Table 4. Startle magnitude means and standard deviations for each picture category

Picture Category	M	SD
Thin Models	48.64	3.09
Average Size Models	49.96	2.67
Neutral Objects	51.38	3.29

Table 5. Skin conductance means and standard deviations for each picture category

Picture Category	M	SD
Thin Models	-0.41	0.72
Average Size Models	-0.24	0.63
Neutral Objects	-0.34	0.54

Figure 1A. SAM rating of valence (with standard error bars) across all picture categories

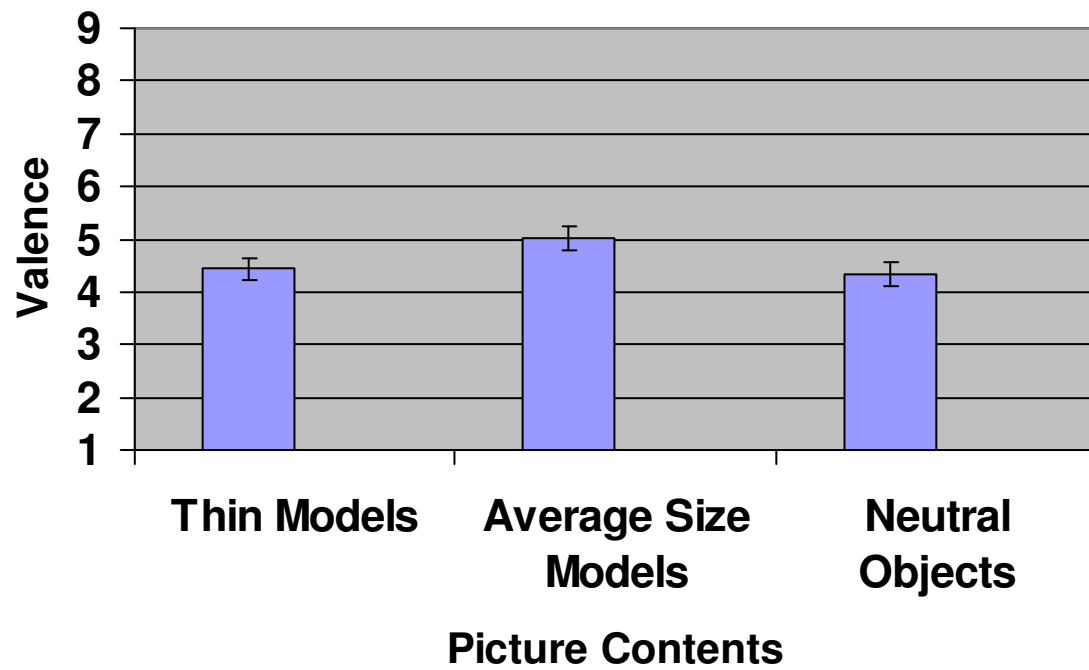


Figure 1B. SAM rating of arousal (with standard error bars) across all picture categories

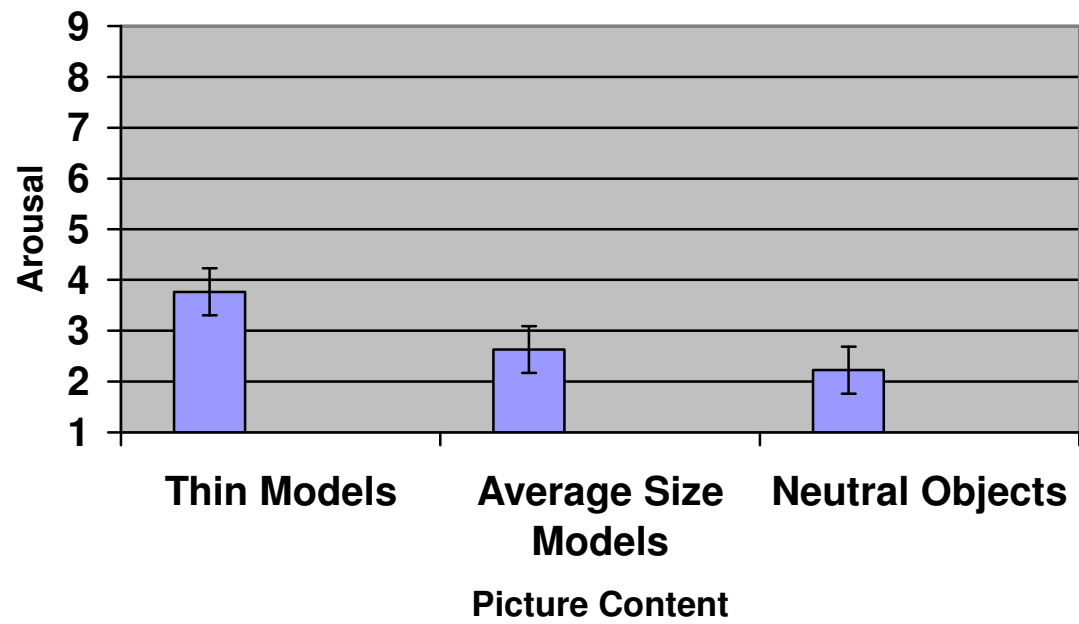


Figure 1C. SAM rating of dominance (with standard error bars) across all picture categories

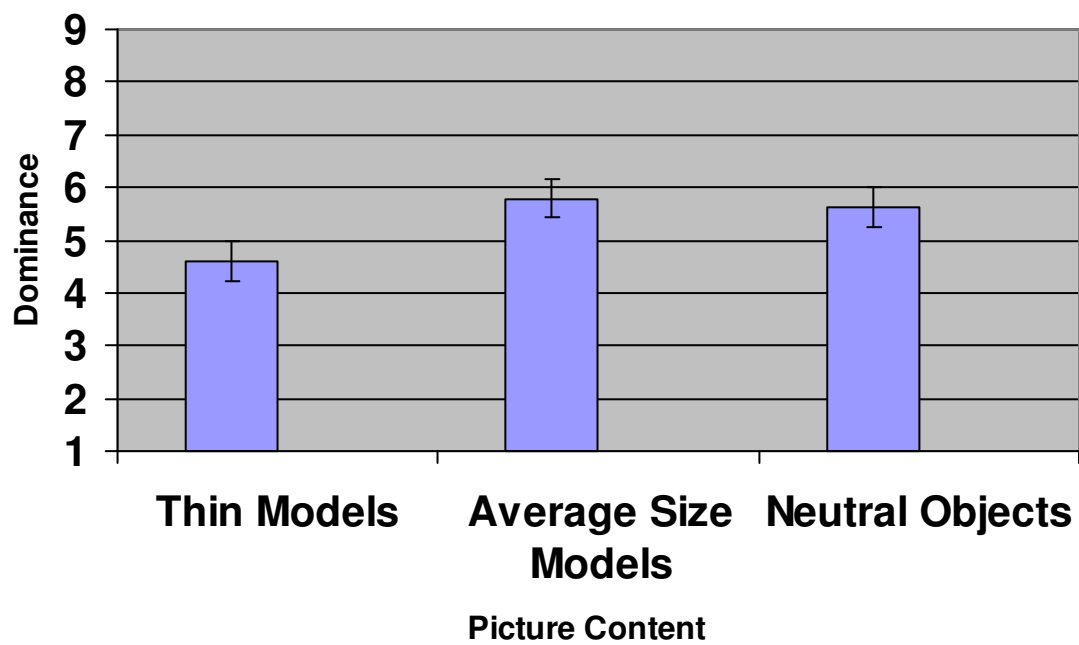


Figure 1D. SAM rating of body satisfaction (with standard error bars) across all picture categories

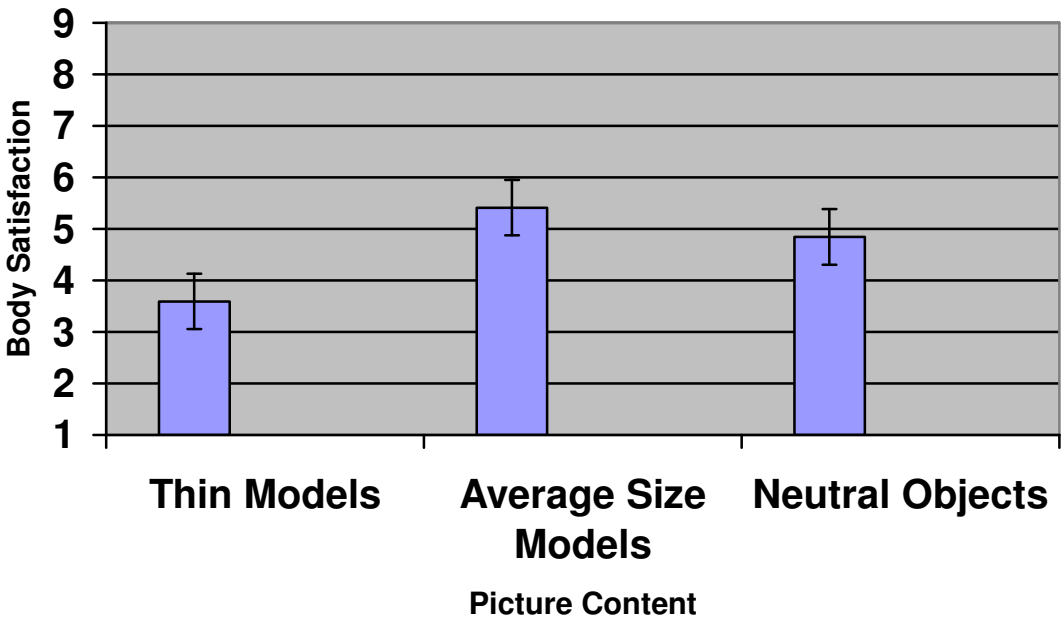
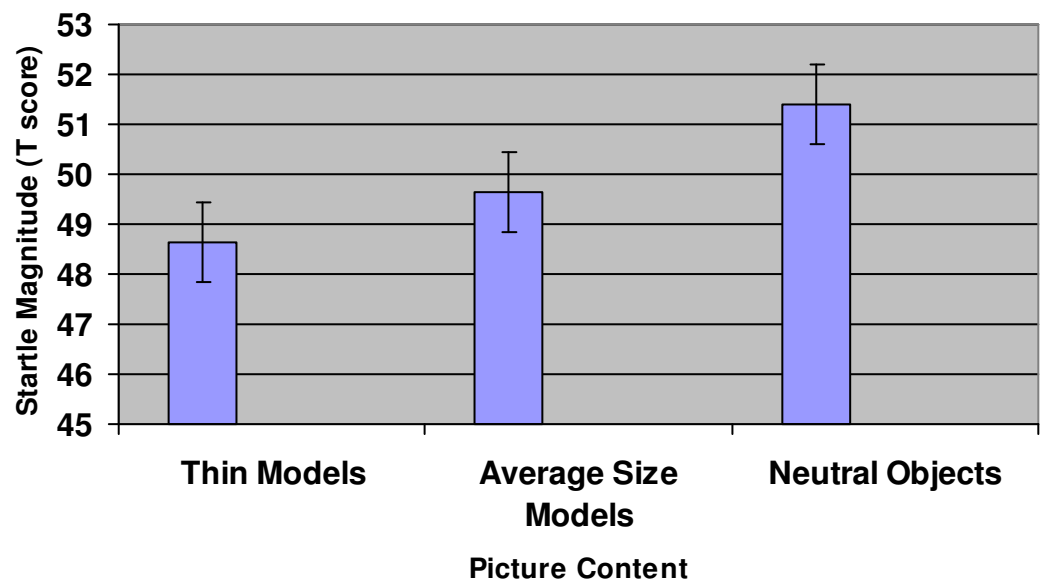


Figure 2. Standardized startle magnitude (with standard error bars) across all picture categories



VITA

Permanent Address

Jeannine Paola Tamez
 Texas A&M University
 Department of Psychology
 4235 TAMU
 College Station, TX 77843

Education:

Bachelor of Arts, Psychology, Our Lady of the Lake University, December 2003
 Master of Science, Clinical Psychology, Texas A&M University, May 2008

Selected Awards and Honors:

L.T. Jordan Institute Fellow, 2008
 Ford Foundation Pre-doctoral Diversity Fellow, 2007-2010
 Acceptance to the National Hispanic Science Network on Drug Abuse Summer Research Training Institute, 2007
 Texas A&M University Graduate Studies Diversity Fellowship, 2005-2008
 Southwestern Psychological Association Undergraduate Research Paper Competition-3rd place, 2004
 Our Lady of the Lake University Outstanding Student Service Award, 2003
 Ronald E. McNair Research Scholar, 2003

Selected Presentations:

- Susabda, A., Tamez, J., Nguyen, Tina, Chaudbury, Mithu, & Cepeda-Benito, A. (2006, October). *The relationship between smoking and chocolate craving among female smokers: An examination of startle eye-blink responses to smoking and chocolate cues*. Poster presented at the 46th Annual Meeting of the Society of Psychophysiology Research, Vancouver, British Columbia.
- Tamez, J. & Cepeda-Benito, A. (2006, September). *The moderating effects of fear of being fat and level of distress on the relationship between smoking outcome expectancies and smoking rate*. Paper presented at the New Investigator Panel of the National Hispanic Science Network on Drug Abuse, Double Tree Paradise Resort, Scottsdale, AZ.
- Tamez, J. & Graham, L. M. (2004, April). *Cognitive styles as predictors of smoking temptation among females*. Paper presented at the 50th Annual Southwestern Psychological Association Conference, Gunther Hotel, San Antonio, TX.
- Tamez, J. & Graham, L. M. (2003, August). *Locus of control and impulsivity as predictors of smoking temptation among females*. Paper presented at the Ronald E. McNair Summer Research Conference, Penn State University, University Park, PA.